Inventory of Onshore Federal Oil and Natural Gas Resources and Restrictions to Their Development

2008

Phase III Inventory—
Onshore United States

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

USGS
science for a changing world

USDA

FOREST SERVICE
DEPARTMENT OF AGRICULTURE

DEPARTMENT OF ENERGY
UNITED STATES OF AMERICA

eia

In compliance with the Energy Act of 2000, P. L. 106-469 § 604 as Amended by the Energy Policy Act of 2005, P. L. 109-58 § 364

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Prepared by the
U.S. Departments of the Interior,
Agriculture, and Energy

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Executive Summary

The Mandate From Congress

In November 2000, Congress enacted the Energy Act of 2000, as amended (also referred to as the Energy Policy and Conservation Act [EPCA]). The Act directed the Secretary of the Interior, in consultation with the Secretaries of Agriculture and Energy, to conduct an inventory of oil and natural gas resources beneath onshore Federal lands:[1]

The inventory shall identify:

> 1) the United States Geological Survey estimates of oil and gas resources underlying these lands;
>
> 2) the extent and nature of any restrictions or impediments to the development of the resources, including:
>
> > (A) impediments to the timely granting of leases;
> >
> > (B) post-lease restrictions, impediments, or delays on development for conditions of approval, applications for permits to drill, or processing of environmental permits . . . .

The EPCA marked the first time that Congress asked the Department of the Interior to conduct a study of restrictions.

On October 11, 2001, Congress provided its sense of priority for this study:
. . . in light of recent attacks on the United States that have underscored the potential for disruptions to America's energy supply, the managers believe this project should be considered a top priority for the Department.

In August 2005, Congress enacted the Energy Policy Act of 2005 (EPAct 2005). Section 364 of this Act amends the inventory requirements of EPCA.[2]

This EPCA Phase III Inventory (Inventory) includes, for the first time, the entire onshore United States. This release is composed of a detailed review of Federal oil and gas resources and constraints on their development within 18 geological provinces. In addition, the rest of the country was extrapolated from the results of these provinces studied in detail (Figure ES-1).

For the Federal agencies that manage public land (principally the Department of the Interior's Bureau of Land Management [BLM] and the United States Department of Agriculture-Forest Service [FS]) and the citizens they serve, this Inventory will serve primarily as a planning tool. It provides public land managers with additional information to help them develop management plans for the lands under their jurisdiction. It enables them to identify areas of high oil and natural gas potential and to evaluate the effectiveness of mitigating stipulations and conditions of approval (COAs) while balancing the development with the protection of other valuable resources in the area. The Inventory offers additional information for

[1] Federal lands are defined as not including Indian lands.

[2] EPAct 2005 amends the inventory requirements at 42 USC 6217. The updates have been reflected in the text of this document.

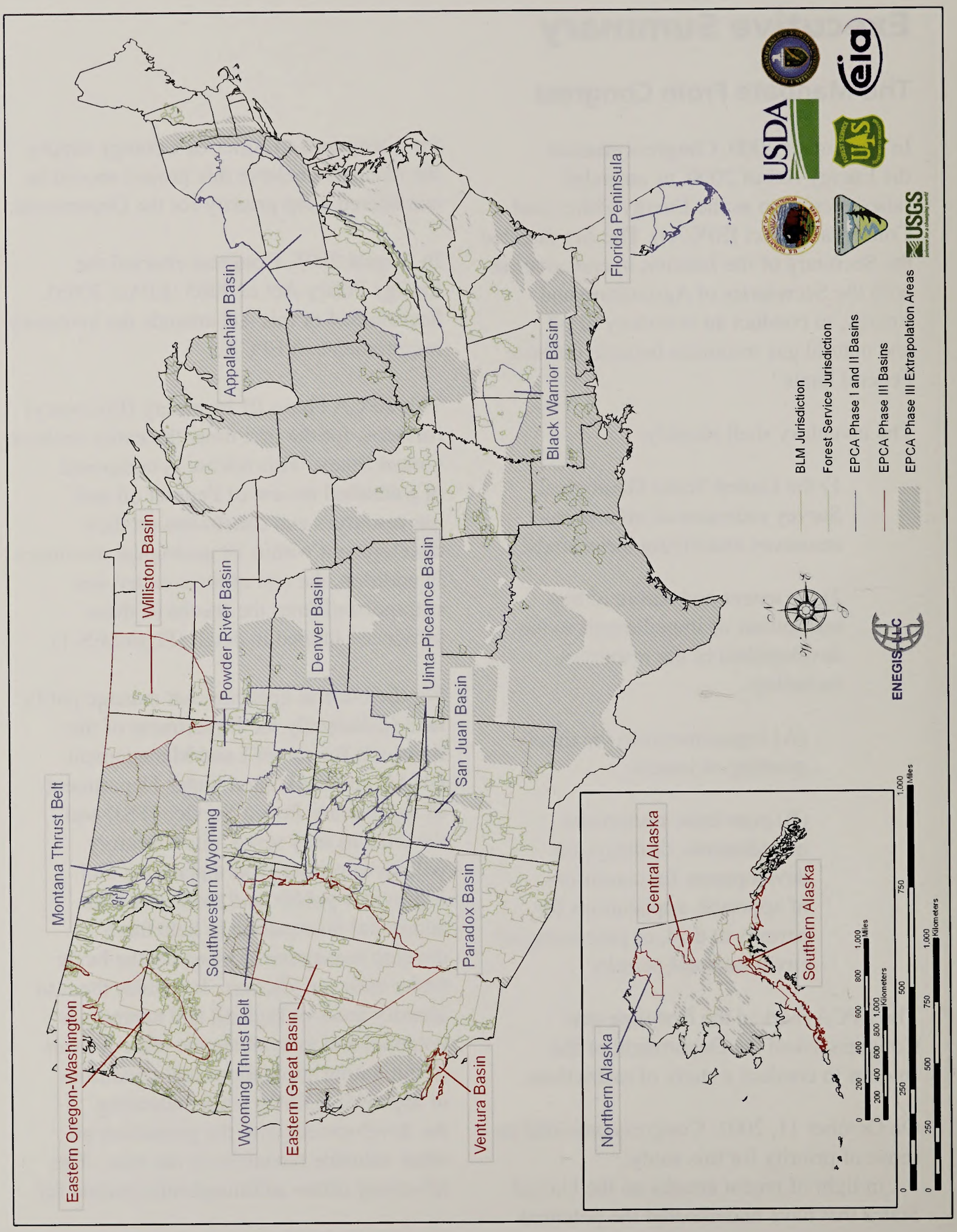

Figure ES-1. Study Area Locations

resource managers to identify areas of low oil and gas potential, but high potential for other resource (e.g., wildlife habitat) values or uses (e.g., recreation). In these situations, resource managers and oil and gas operators can consider applying land management strategies that promote increased protection of other valuable resources or uses that might ordinarily conflict with oil or gas development. This report is a critical step in evaluating whether the documented impediments and restrictions are appropriate, and to what extent they constrain oil and gas development.

This Inventory provides information regarding the geographical relationship between oil and gas resources and the constraints that govern their development. It is not a reassessment of any stipulations or COAs on the development of oil and gas resources. The public's opportunity to participate in any change of restrictions on oil and gas activities will occur during the land use planning or legislative process. This Inventory provides basic information. Additional information may be available from monitoring and scientific studies incorporated into adaptive management processes.

This Inventory was prepared under the lead of the BLM. Senior professionals from the Department of the Interior's BLM and United States Geological Survey (USGS), the FS; the Department of Energy (DOE)-Office of Fossil Energy, and the Energy Information Administration (EIA) were the major contributors. The USGS provided the assessment of undiscovered technically recoverable oil and natural gas resources for Federal lands. The EIA contributed the estimate of reserves growth and proved reserves for Federal lands. The DOE provided technical expertise to guide the design and analysis process for the Inventory. Field offices of the BLM and the FS contributed their land use planning information regarding oil and natural gas availability and leasing stipulations for the lands under their respective jurisdictions.

Methodology

This Inventory is based on information that was previously developed through the scientific and land use planning processes of the contributing Federal agencies. This information, in large part, was provided to the public for its review and use and is the best that is commercially and scientifically available. It was compiled and analyzed by experts from the contributing agencies. The analytical methods and protocols used in the supporting studies were subjected to rigorous review. The present study necessarily incorporates the assumptions, conditions, and limitations of the supporting scientific information, as discussed in this report. This Inventory is significant because it builds upon the process established in the EPCA Phase I and II Inventories, and now covers Federal lands throughout the United States. It examines oil and natural gas (undiscovered technically recoverable resources and reserves growth) in context with information about constraints on the resource's development.

The Inventory examines in detail six geological provinces in addition to the twelve included in the Phase II of EPCA. These six provinces are Central Alaska (Yukon Flats portion); Southern Alaska; Eastern Oregon-Washington; the Ventura Basin in California; the Eastern Great Basin in Idaho, Nevada, Utah and Arizona; and the Williston Basin in Montana, North Dakota and South Dakota.

The Inventory encompasses the 1.2 billion acres of land that the USGS inventoried as a part of its National Oil and Gas Assessment (NOGA), of which about 279 million are under Federal management. This acreage includes split-estate lands where lands with non-Federal surface are underlain by Federal mineral rights.

This analysis of constraints to development centers on two factors that affect access to oil and gas resources on Federal lands. These factors are: (1) whether the lands are "open" or "closed" to leasing (i.e., accessible or inaccessible), and (2) the degree of access afforded by lease stipulations and other conditions on "open" lands (some leasable lands may in effect be "closed" if no drilling can occur). All oil and gas leases are subject to a baseline level of constraint governed by statutory and regulatory requirements (standard lease terms [3]). These stipulations serve many purposes, ranging from the protection of environmental, social, historical, or cultural resources or values to the payment of rentals and royalties.

The Inventory finds that approximately 3,125 individual lease stipulations are being applied, in addition to the aforementioned standard lease terms, by the land managing agencies in the areas analyzed in detail. To focus the analysis of constraints on oil and gas development, the Inventory evaluates the onshore Federal lands: (1) where leasing is permitted under standard lease terms; (2) where leasing is permitted with varying limitations on access, principally seasonal occupancy restrictions; and (3) where oil and gas leasing is precluded or prohibited.

The Inventory also considers exceptions to stipulations that may be granted after a review of on-the-ground conditions and the use of modern technologies such as directional drilling. The impact of COAs attached to Federal drilling permits is also analyzed, which gives a more complete assessment of access constraints. A total of 157 unique COAs were identified and their effects on development evaluated. The nine categories of constraints analyzed in this report include the complete range of access restrictions associated with oil and gas leasing.

Results

The results of this Inventory are unique for each of the eighteen comprehensively studied areas examined. The aggregate results for all of the study areas and extrapolated areas (Table ES-1, Figure ES-2, and Figure ES-3) are summarized below.

- Federal lands with potential for oil or natural gas resources, including split-estate minerals, total 279.0 million acres.
- Undeveloped oil resources under these Federal lands total 30.5 billion barrels, comprising 24.2 billion barrels of undiscovered technically recoverable resources and 6.3 billion barrels of reserves growth.
- Undeveloped gas resources under these Federal lands total 231.0 trillion cubic feet, comprising 214.1 trillion cubic feet of undiscovered technically recoverable resources and 16.9 trillion cubic feet of reserves growth.
- Total proved reserves under these Federal lands total 5.3 billion barrels of oil and 68.8 trillion cubic feet of natural gas.
- Approximately 60 percent (165.9 million acres) of the Federal land

[3] See the "LEASE TERMS" section of the BLM form 3100-11 at http://www.blm.gov/style/medialib/blm/wy/minerals/og/ogforms.Par.9931.File.dat/Form_3100-11.pdf

is inaccessible. Based on resource estimates, these lands contain about 62 percent of the oil (19.0 billion barrels) and 41 percent of the natural gas (94.5 trillion cubic feet).

- Approximately 23 percent (65.2 million acres) of the Federal land is accessible with restrictions on oil and gas operations beyond standard stipulations. Based on resource estimates, these lands contain 30 percent of the oil (9.3 billion barrels) and 49 percent of the gas (112.9 trillion cubic feet).
- Approximately 17 percent of the Federal land in these areas (48.0 million acres) is accessible under standard lease terms. Based on resource estimates, these lands contain 8 percent of the oil (2.3 billion barrels) and 10 percent of the gas (23.6 trillion cubic feet).

Overall the study shows that oil and gas resources are most concentrated in Northern Alaska and the Interior West. Figure ES-4 summarizes the accessibility of these resources on a quadrillion British thermal unit (quad) basis[4].

Compliance With The Law

All oil and gas leases on Federal lands, including those issued with only the standard lease terms, are subject to full compliance with all environmental laws and regulations. These laws include, but are not limited to, the National Environmental Policy Act, Clean Water Act, Clean Air Act, Endangered Species Act, and National Historic Preservation Act. While compliance with these laws may delay, modify, or prohibit oil and gas activities, these laws represent the values and bounds Congress believes appropriate to manage Federal lands. The present study was requested by Congress to provide information to deliberate on the role of Federal lands in contributing to the U.S. energy supply.

It is important to emphasize that this Inventory was prepared at the direction of Congress. It is not a decision-making document. The Inventory identifies Federal land areas of varying oil and natural gas potential and the nature of constraints to the development of those resources across the U.S. Any reassessment of restrictions on oil and gas activities will occur as part of the public land use planning or legislative processes, both of which are fully open to public participation and debate about the appropriate balance between resource protection and resource development.

[4] One quad BTU is equivalent to 0.9756 TCF or 172.4 MMBO.

Table ES-1. Onshore United States—Total Federal Land and Oil and Natural Gas Resources by Access Category

Access Category			Area		Resources[a]			
					Total Oil[b]		Total Gas[c]	
			(acres x 1000)	Percent of Federal	(MMbbls)[d]	Percent of Federal	(BCF)[e]	Percent of Federal
More Constrained ↑	1.	No Leasing (Statutory/ Executive Order) (NLS)	39,945	14.3%	9,054	29.7%	19,449	8.4%
	2.	No Leasing (Administrative) (NLA)	50,414	18.1%	2,461	8.1%	16,618	7.2%
	3.	No Leasing (Administrative) Pending Land Use Planning or NEPA Compliance (NLA/LUP)	55,278	19.8%	6,684	21.9%	49,814	21.6%
	4.	Leasing, No Surface Occupancy (NSO) (Net NSO for O&G Resources)	20,245	7.3%	777	2.5%	8,621	3.7%
	5.	Leasing, Cumulative Timing Limitations (TLs) of >9 Months	283	0.1%	32	0.1%	430	0.2%
	6.	Leasing, Cumulative Timing Limitations (TLs) of >6 to ≤9 Months	11,883	4.3%	5,198	17.0%	40,021	17.3%
	7.	Leasing, Cumulative Timing Limitations (TLs) of >3 to ≤6 Months	18,389	6.6%	1,799	5.9%	35,751	15.5%
	8.	Leasing, Controlled Surface Use (CSU)[f]	34,631	12.4%	2,231	7.3%	36,716	15.9%
Less Constrained ↓	9.	Leasing, Standard Lease Terms (SLTs)	47,972	17.2%	2,268	7.5%	23,554	10.2%
Total, Federal Lands including Split Estate			**279,039**	100%	**30,503**	100%	**230,975**	100%
Total Non-Federal			**936,414**		**58,056**		**423,282**	
Total Inventory Area			**1,215,453**		**88,560**		**654,256**	

Summary						
Inaccessible (Categories 1-4)	165,882	60%	18,976	62%	94,502	41%
Accessible with Restrictions (Categories 5-8)	65,186	23%	9,260	30%	112,919	49%
Accessible under Standard Lease Terms (Category 9)	47,972	17%	2,268	8%	23,554	10%
Total, Federal Lands Including Split Estate	**279,039**	**100%**	**30,503**	**100%**	**230,975**	**100%**

[a] Undiscovered technically recoverable resources and reserves growth

Small rounding errors may be present.

[b] Including oil, natural gas liquids (NGLs) and liquids associated with natural gas reservoirs

[c] Including associated dissolved and nonassociated natural gas

[d] Million barrels [e] Billion cubic feet [f] Includes Cumulative Timing Limitations of ≤3 months

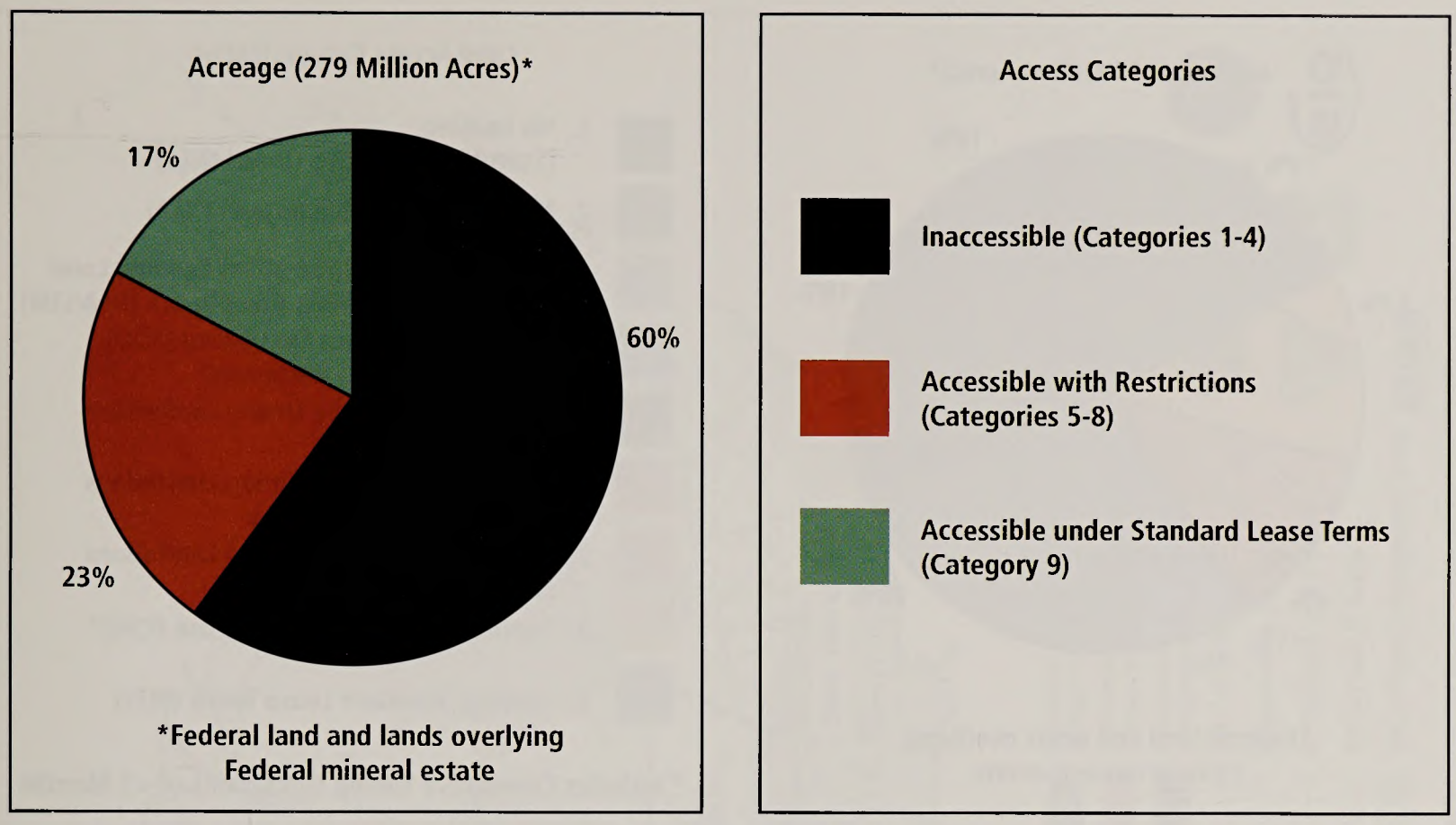

Figure ES-2. Simplified Chart of Results; Onshore United States—Total Federal Land and Oil and Natural Gas Resources by Accessibility*

* Undiscovered technically recoverable resources and reserves growth.

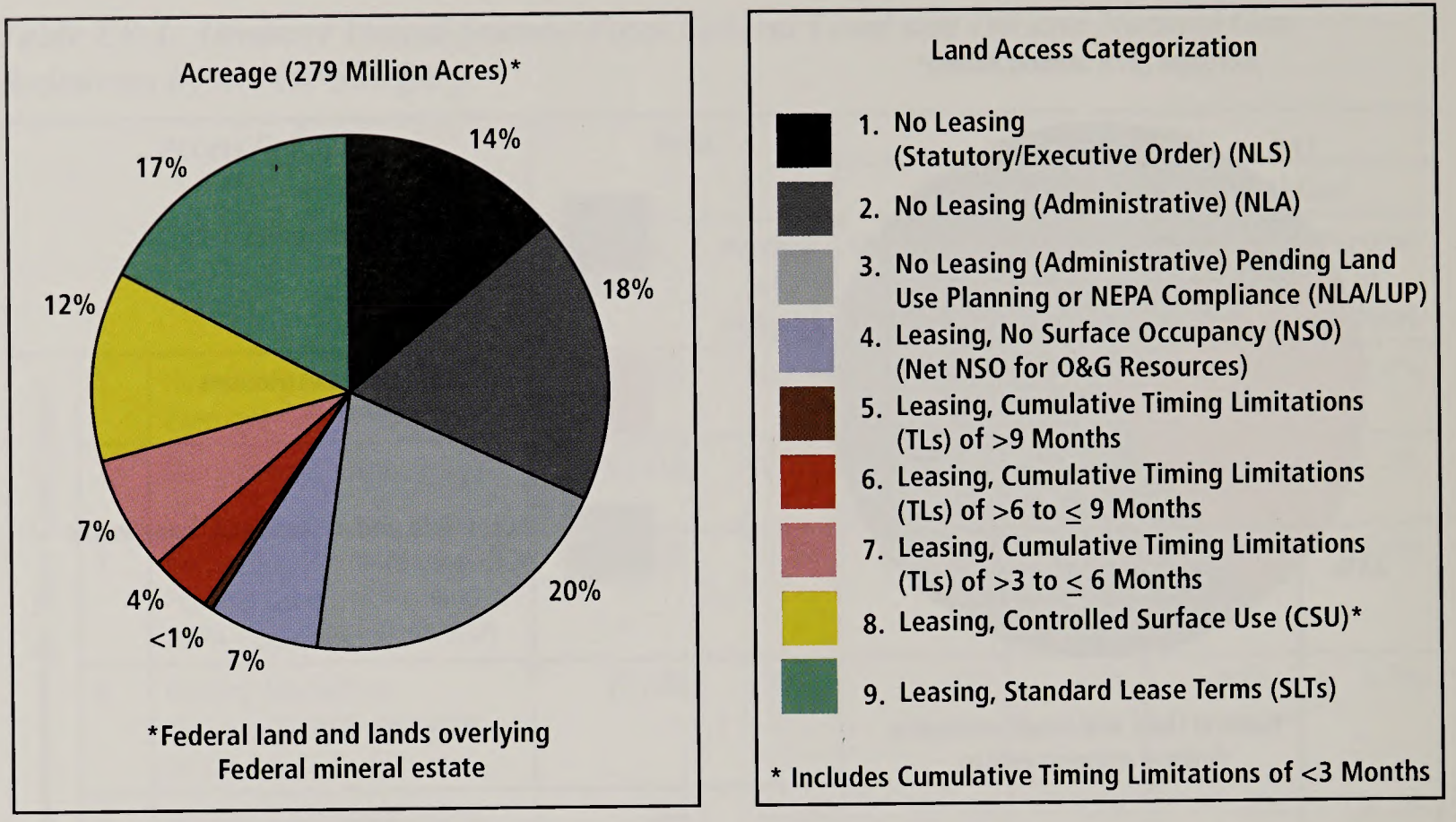

Figure ES-3. Chart of Results; Onshore United States—Total Federal Land and Oil and Natural Gas Resources* by Access Category

* Undiscovered technically recoverable resources and reserves growth.

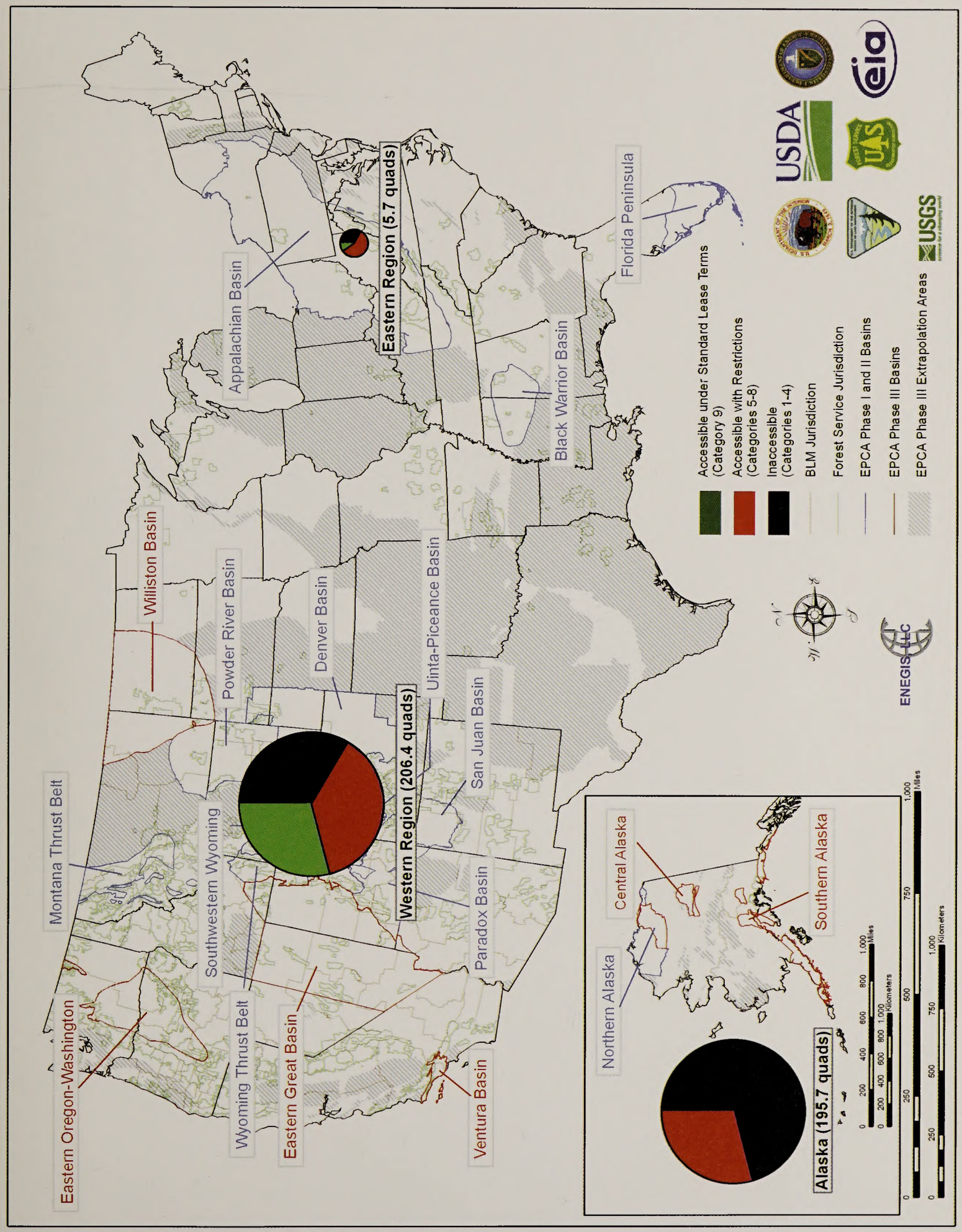

Figure ES-4. Regional Charts

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